US-PAT-NO: 6078568

DOCUMENT-IDENTIFIER: US 6078568 A
See image for Certificate of Correction

TITLE: Multiple access communication network with dynamic access control

--------- KWIC ---------

   The benefits of the present invention may further be understood in the
context of Aloha system performance. The dynamics of the stability issue may
be revealed if the throughput versus attempt rate response (S vs. G curve) of
an existing slotted Aloha system is considered, as illustrated in FIG. 24.
Misinterpretation of the system's performance occurs because it would appear
that provided the attempt rate (G) is kept below unity, the channel utilization
(S) would appear acceptable and stable. Unfortunately this static
interpretation is flawed because it does not reflect the time based dynamic
behavior of the system. The Aloha system is stable if and only if the
departure rate is equal to the arrival rate. Consider the scenario when the
attempt rate is unity. For every 10 transmission attempts, approximately 3 are
successful. The 7 unsuccessful packets will become queued for re-transmission.
During a subsequent time interval in which another 10 transmission attempts are
executed, only 3 transmission attempts may correspond to new packets that
have
arrived if stability is to be achieved. If less than 3 new packets arrive, the
operating point on the Aloha response curve will drift to the left and the
channel utilization will fall. This is a satisfactory occurrence because
although the channel is not being utilized at its maximum, the delay
experienced with the delivery of each packet is negligible and the system
appears to provide excellent service to all users. However, if the number of
new arrivals exceeds 3, the number of transmission attempts in a subsequent
interval of time will exceed 10 and, as a consequence, an increase in the
number of collisions will be observed. This will cause the number of
successful transmissions to fall, which results in a decrease in channel
utilization and a further increase in the number of attempted re-transmissions
during a subsequent time slot. Consequently, the operating point to drifts to
the right of the optimum operating point. If the new arrival rate continues to
exceed the successful departure rate then the operating point will continue to .

drift to the right. This is a highly undesireable scenario because the channel utilization falls and, as a consequence, so does the level of revenue-bearing traffic. The delay associated with the delivery of each packet dramatically increases and the quality of the system that is perceived by the users falls. This scenario is often referred to as an Aloha or Reverse channel collapse.

US-PAT-NO: **6055564**

DOCUMENT-IDENTIFIER: **US 6055564 A**

TITLE: **Admission control where priority indicator is used to discriminate between messages**

——— **KWIC** ———

   If the message is not part of a transaction in-progress, the admission
control gateway 125 can also admit the message as a new session if it is
determined that the server has sufficient processing resources available, as
determined by comparison with the set of parameters 129 (the determination is
indicated in FIG. 3 by the reference numeral 147). The admission control
gateway 125 can further admit the message if it is determined that the message
corresponds to a message which has been previously deferred, as indicated by a
decision block 149. In this regard, these two determinations can be performed
in alternative order depending upon the particular implementation. For
example, in an embodiment where reserved <u>time slots</u> are used and <u>dynamic</u>
parameters 129 are used to regulate un-reserved (or contention) <u>time slots</u>, it
is preferable to detect new sessions having reserved <u>time slots</u> so as to not
reduce the number of contention slots available. In the preferred embodiment,
specific slots are not used and the parameters 129 include a single, <u>static</u>
threshold, with lowest priority (e.g., most recently received, non-priority)
messages being deferred, even if already in-progress, if the server only has
processing resources for priority messages. Consequently, the determinations
can equivalently be performed in the preferred embodiment in the order
indicated in FIG. 3. Notably, processing using priority classes is identified
as a processing block by the reference numeral 500, and will be discussed
further below. If the determinations do not result in admission of the message
to the server, then the message is sent to the deferral manager, as indicated
by the bottom most block 141 of FIG. 3.

US-PAT-NO: 4718062

DOCUMENT-IDENTIFIER: US 4718062 A

TITLE: Telecommunication system for alternatingly transmitting
circuit-switched and packet-switched information

------- KWIC ---------

A system is described for multiplexing telephony channels with **static and
dynamic** capacity. A **static** channel occupies a **time slot** in a fixed frame
structure. The **dynamic** channels utilize idle **time slots.** A status bit per
time slot states whether the **time slot** is occupied or not. According to the
invention, equipment for transmitting circuit-switched information is combined
with equipment for transmitting packet-switched information, such that a hybrid
system is obtained which, under the control of a status bit, alternatingly
transfers information from the respective equipment in response to the polarity
of the status bit.

The system in accordance with the invention, which solves the
above-mentioned problem, is characterized by the claims and includes an
apparatus for multiplexing telephony channels with **static and dynamic**
capacity.
A **static** channel occupies a **time slot** in a fixed frame structure. The **dynamic**
channels utilize unoccupied **time slots.** A status bit per **time slot** denotes
whether the slot is occupied or not. The above-mentioned problems are solved
by a memory unit CS (Circuit Switch) in a transmitter for circuit switching
being continuously scanned in an apparatus for alternatingly transmitting
circuit-switched and packet-switched information, and that the memory contains
information corresponding to a number of **time slots,** in their turn
corresponding to a number of information channels in a TDM-system. Each **time
slot** is assigned with the aid of a **time slot** number, and in every memory
position corresponding to a **time slot** there is written a data word. A status
bit is inserted in the data word, which comprises a plurality of bits, this
status bit having a polarity which on scanning denotes whether an assigned
channel is occupied or not. If the channel is occupied, i.e. the status bit
has a given polarity, e.g. a logical One, the information is sent out on the
line to a receiver from said circuit-switching transmitter. On the other hand,
if the **time slot** is idle, which is apparent from the status bit having the

reversed polarity, in this case a logical Zero, the information is instead sent out over the line to the receiver from a buffer memory PS (Packet Switch) in a transmitter for packet-switching. The circuit-switching memory CS has priority over the packet switching memory PS, the latter memory only being allowed to send when an idle **time slot** is detected on scanning the memory CS. The right to send falls directly therafter to the circuit-switching memory CS. The memory PS sends a segment which is equally as great as the **time slot** excluding the status bit.

US-PAT-NO: **5930334**

DOCUMENT-IDENTIFIER: **US 5930334 A**

TITLE: **Method and apparatus for monitoring the operation of telecommunications equipment**

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   In this example application, the subscriber line includes not only the
wireline 18 and corresponding line interface circuit 20 but also the
multiplexer/demultiplexer (MUX/DEMUX) 42 and an assigned TDM timeslot(s) on
TDM
line 44. Thus, depending upon whether individual **time slots** are assigned to
subscriber lines in a **static or dynamic** fashion, the actual subscriber path
corresponding to a subscriber line may vary.

US-PAT-NO: **5875184**

DOCUMENT-IDENTIFIER: **US 5875184 A**

TITLE: **Method for transferring data packets**

———— KWIC ————

  The reason is that if the **time slots** are allocated to the user stations as needed, in other words for example on a load-dependent basis, it is on the one hand possible to react flexibly to fluctuating network load conditions. A user station that currently has a high transfer requirement thus receives more **time slots** assigned to it than other user stations which have no data or very little data to transfer per unit time. This is possible, surprisingly, because channels are not only (as in the related art) allocated to the user stations from the frequency-hopping pattern, but rather **time slots** are allocated to the user stations, the particular channels to be used for transfer being defined by the frequency-hopping pattern. The frequency-hopping pattern itself can be, for example, **static,** or can be managed dynamically by the primary users based on channel occupancy. This can occur, however, independently of the **dynamic** allocation of **time slots** to the user stations.

US-PAT-NO: **5732076**

DOCUMENT-IDENTIFIER: **US 5732076 A**

TITLE: **Coexisting communication systems**

———— **KWIC** ————

In more detail, each base station unit 852, 853 is provided with means for
determining which **time slots** of the composite time frame are available, or have
been preassigned to it, for communication. The first base station unit 852 has
a free slot index 863 which may comprise, for example, a **static or dynamic**
memory. If the free slot index 863 comprises a **dynamic** memory, then it may be
downloaded remotely by a base station controller 105 (see FIG. 2) so as to
allow **dynamic** reprogramming of the **time slot** allocation to the base station
units 852, 853. The free slot index 863 stores a map of **time slots** allocated
to the base station unit 852. Thus, if composite time frame 925 of FIG. 15 is
implemented in the FIG. 13 integrated base station 850, then the free slot
index 863 would comprise a map having sixteen locations, each location
corresponding to one of the **time slots** 922, with the locations corresponding to
time slots TS00, TS04, TS08, and TS12 being set to indicate their assignment to
the first base station unit 852.